

## AVIATION COMBAT ELEMENT (ACE) LEGACY AIRCRAFT MODERNIZATION

The Marine Corps has several significant aviation modernization programs underway to restore and enhance the capabilities of its existing aircraft and systems. These modernization efforts are vital to the services' near- to mid-term combat capabilities.

### CH-46E SEA KNIGHT

The CH-46E Sea Knight performs medium lift combat missions in the execution of the assault support function of Marine aviation. The CH-46E is fulfilling a critical role in Operation Iraqi Freedom. Sustainability, performance improvement, and payload recovery programs are essential to ensure the platform continues to meet Marine Air Ground Task Force (MAGTF) and joint war fighting requirements through the next ten years.

Because the CH-46E continues to play a vital role in support of the Global War on Terror, Aircraft Survivability Equipment Systems are being upgraded, including the missile warning system, countermeasures dispensing system, and infrared missile jamming system to mitigate enemy threats. Numerous weight reduction initiatives have been commenced which are targeting 1000 pounds of payload recovery. Lightweight ceramic armor has been procured to replace the original steel armor. CH-46E readiness and utilization rates are at historic highs and the efforts underway will help it safely and effectively perform the mission until retirement.

### CH-53E SUPER STALLION

The CH-53E Super Stallion is a three-engine, long-range, heavy-lift helicopter that has been key to the assault support function of Marine Aviation, but the CH-53E cannot support the range and payload requirements necessary to the Marine Corps future war-fighting concepts as currently envisioned. The current fleet of aircraft will reach the end of its fatigue life during this decade, and a sustainment strategy has been implemented to address critical fatigue, obsolescence, and reliability issues, until the aircraft can be replaced. A comprehensive re-design of the Marine Corps heavy lift platform, focusing on reliability, maintainability, cost of ownership, and performance, is required to effectively meet MAGTF and joint war fighting requirements over the next 25 years. The CH-53K program, formerly known as the Heavy Lift Replacement Program (HLR), is the solution to maintaining a heavy-lift capability beyond the year 2025. The CH-53K is a derivative design of the existing CH-53E, remaining within the same shipboard footprint, and is critical to properly and cost-effectively supporting sea-based Expeditionary Maneuver Warfare (EMW) for the Marine Corps in the 21st century. The CH-53K will provide the Marine Corps with the ability to transport 27,000 lbs of cargo out to 110 nautical miles (NM), providing twice the lift capability of the CH-53E under the same conditions. Major system improvements of the new build helicopter include: larger and more capable engines, an expanded gross weight airframe, an

enhanced drive train, advanced composite rotor blades, a modern interoperable cockpit, improved external and internal cargo handling systems, and increased survivability and force protection.

### AV-8B HARRIER

The AV-8B Harrier Open Systems Core Avionics Requirement (OSCAR), which updates obsolete software and computer equipment, has entered service. OSCAR with Operational Flight Program H4.0 enables the AV-8B to employ both 1,000 and 500 lbs variants of the Joint Direct Attack Munitions and provides tremendous improvements in radar and LITENING advanced targeting pod capability.

The LITENING advanced targeting pod significantly improves the AV-8B's lethality and survivability. This third-generation, forward-looking infrared set, dual field-of-view television seeker, and infrared marker provides improved target recognition and identification, while the laser designator and laser spot tracker provide precision targeting capability. Some LITENING pods have also been equipped with a C-band video downlink, which allows real-time video to be sent to ground-based commanders and forward air controllers equipped with the Rover III receiver station. This facilitates time-sensitive targeting and reduces the risk of fratricide and collateral damage.

In order to maintain a world-class training environment, the two-seat TAV-8B trainers are undergoing an upgrade

program that adds the OSCAR mission computer, night vision goggle-compatible lighting, and the more powerful and reliable Rolls Royce Pegasus (408) engine. These improvements are increasing the training capability of the AV-8B fleet replacement squadron, as well as the abilities of replacement pilots reporting to fleet squadrons. The enhancements to the Harrier are critical in providing continued support to the MAGTF until the tactical aviation (TacAir) Integration implementation and Joint Strike Fighter (JSF) transition are complete.

### F/A-18 HORNET

The F/A-18A+ Upgrade (Engineering Change Proposal 583) consists primarily of avionics and hardware upgrades that allow the F/A-18A+ Hornet to process and use updated versions of F/A-18C software and accessories. A large portion of this modification enhances commonality between the "A+" and "C" aircraft, reducing logistics footprint, and pilot and maintenance training requirements, as well as mitigating obsolescence issues. The modified "A+" aircraft is compatible with a Lot XVII F/A-18C aircraft, an aircraft eight years younger. This upgrade also enables the "A+" aircraft to employ all current and programmed future weapons.

Fifty-six aircraft are scheduled to receive the upgrade, enabling the upgraded "A" model aircraft to remain active through 2020. These additional, relevant F/A-18 airframes are instrumental in

supporting the Navy-Marine Corps TacAir Integration plan.

The F/A-18D Advanced Tactical Airborne Reconnaissance System (ATARS) provides manned airborne tactical reconnaissance capability to the MAGTF. ATARS incorporates multiple sensor capabilities including electro-optical, infrared, and synthetic aperture radar. ATARS-equipped aircraft carry all sensor capabilities simultaneously, enabling imagery that is selectable by the aircrew in flight. Another significant capability of ATARS is its ability to transmit digitally collected data in near-real time to ground receiving stations. This imagery can be data-linked to various intelligence systems for national exploitation via the Tactical Exploitation Group. Twenty-two ATARS sensor suites and 31 ATARS modified aircraft are now operational in all five Marine Corps F/A-18D squadrons.

The LITENING advanced targeting pod provides the F/A-18 with a significant improvement in its lethality and survivability. LITENING is the Marine Corps third generation capability for its expeditionary aircraft. This forward-looking infrared sensor, dual field-of-view television seeker, and infrared marker, provides improved target recognition and identification, while the laser designator and laser spot tracker provide precision targeting capability. All F/A-18 and AV-8B supporting the Global War On Terror deploy with LITENING pods equipped with a video downlink.

Based upon the LITENING pod's proven combat value during recent op-

erations, the Marine Corps has modified expeditionary F/A-18 aircraft to carry the LITENING pod. It is a proven capability that better enables Marine Aviation to support the MAGTF and Joint Force commanders.

### KC-130 HERCULES

All of the legacy KC-130 aircraft will be replaced with KC-130Js which will culminate in one Type/Model/Series tactical aerial refueler/assault support aircraft for the Marine Corps.

### EA-6B PROWLER

EA-6B upgrades maintain Marine Prowlers as an essential combat-proven element of the MAGTF and the joint force. The cornerstone of the modification and upgrade plan is the Improved Capabilities III (ICAP III) weapon system for both Marine and Navy EA-6B squadrons. The core of ICAP III is the ALQ-218 digital receiver system. This is the first receiver upgrade to the EA-6B since its fleet introduction more than 30 years ago. The improved receivers will enable more precise jamming, while also improving aircrew situational awareness and reducing life cycle costs.

ICAP III attained initial operational capability for the Navy in fiscal year 2005. The EA-6B's successful re-winged and upgrades will also be critical to maintaining the airframe's viability through 2016.